THE plates for the April number of *Rhodora*, Journal of the New England Botanical Club, were destroyed in the recent fire at the Heintzemann press-rooms in Boston. The appearance of the April and May issues of *Rhodora* will necessarily be somewhat delayed.

SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCES.

SECTION OF ASTRONOMY AND PHYSICS.

A MEETING of the Section was held on Monday evening, February 5th. Professor J. K. Rees presented a report on November meteors. Arrangements were made by the Columbia University observatory to observe and photograph the meteors during the week of November 12 to 18, 1899. At West Point, Dr. S. A. Mitchell, assisted by Messrs. Bauer and Jenkins, was provided with a Rowland concave grating and two cameras. No photographs however were obtained. At Bayport, L. I., Mr. C. A. Post had placed his observatory and his services at the disposal of the Columbia observatory staff. Six cameras and two telescopes were made use of. On one plate in a camera provided with a Goerz lens, a photograph taken on November 15th, between 16 h. 9 m. 30 sec., and 16 h. 40 m. 44 sec., when pointed near Procyon, showed a meteor trail. Dr. Elkins of the Yale observatory will measure this plate.

A number of students and others watched for the meteors for the purpose of counting them, at West Point, New York, and Bayport. At West Point, in about four hours on November 15th, 17 meteors were seen of which 12 were Leonids. In New York on the same evening, three observers counted 68 in about 5 hours. Two other observers counted 36 in 2½ hours. At Bayport, two observers counted 39 in about 3½ hours.

Professor Rees, observing casually while attending to the photographic apparatus at Bayport, observed a first magnitude Leonid at 15 h. 29 m., on November 15th, between the two lowest stars in the handle of the Dipper. At 15 h. 39 m., he observed another first magnitude Leonid under Sirius. At 17 h. 15.5 m. a fine Leonid trail, lasting 3 seconds, was seen over Procyon. At 17 h. 30 m. a very bright Geminid was seen 20° south of Regulus.

Professor Rees also presented a paper on the variation of latitude, and the constant of aberration of light, as determined from six and one-half year's observations made at the Columbia University latitude observatory. Observations of latitude were made at the new site of Columbia University from April 24, 1893, to the present time, and will be continued until May 1, 1900. The observers were Professors Rees and Jacoby, and Dr. H. S. Davis. A zenith telescope made by Waunscaff of Berlin, was employed throughout. Its aperture is 80 mm., and its focal length is one meter. Four groups of stars were used, having mean right ascensions of about 6 h., 14 h., 18 h., and 22 h. respectively. Each group contained seven stars. Up to the present time, 6518 pairs have been observed on 758 nights. From the observations, a curve was drawn showing the latitude. This was compared with the curve required by Dr. S. C. Chandler's formula (*Ast. Jour.*, No. 446). From 1896, the observed epochs of maxima and minima seem to follow the computed in time.

These observations give for the constant of aberration of light the value

$$20''.464 \pm 0''.006.$$

Mr. George H. Bauer read a paper on the parallax of μ Cassiopeiæ and the positions of 56 neighboring stars, as deduced from the Rutherfurd photographic measures. This star has a large proper notion, and measurements of its parallax have been made by various methods and observers. The present determination is based on 28 Rutherfurd photographic plates, and the method of position angle was used in measuring them, as Professor Jacoby has already made a reduction using the method of distance. Eleven independent determinations were made giving a value of

$$0''.238 \pm 0''.014.$$

Professor Jacoby found by the method of distance $0''.275 \pm 0''.024$. These results agree even better than might have been expected. In forming the catalogue of 56 stars about μ Cassiopeiæ, the usual corrections for refraction, precession, nutation, aberration, proper motion, etc., were applied. Since the co-ordinates were measured in distance and position angle, these were then converted into difference of right

ascension and declination. After finding the positions for the epoch 1872.0, the precession and secular variation were computed and tabulated.

WILLIAM S. DAY,
Secretary of Section.

SECTION OF GEOLOGY AND MINERALOGY.

AT the meeting on March 19, 1900, Mr. G. F. Kunz presided, and forty-nine persons were present.

The secretary announced that this section and the Biological section had been requested to nominate candidates before April 20th, for the grant of the Newberry Research Fund, the grant this year being restricted to those working in botany and geology. Authority was granted to the chairman and secretary of the section to make such nominations to the council.

The chairman announced the course of lectures on 'The Principles of Geology' to be delivered at Johns Hopkins University in April, under the G. H. Williams memorial lectureship, by Professor W. C. Brögger, of Christiania; also the receipt of the program of the International Geological Congress, at which the Academy would be represented by Professor J. J. Stevenson.

The chair announced the death of Doctor Oliver P. Hubbard, one of the earliest members of the Academy. On motion of Professor R. E. Dodge, a committee of three was appointed to draft resolutions on the death of Dr. Hubbard, and the chair appointed Dr. Julien and Professor Stevenson such a committee.

Professor Stevenson presented the following minute upon the life of Dr. H. B. Geinitz, whose death was announced at the February meeting.

Professor Dr. Hans Bruno Geinitz, for many years an honorary member of this Academy, died January 28, 1900, in the 86th year of his age.

His work as a geologist began very early, for in 1837, when only twenty years old, he published a paper on the 'Muschelkalk.' From that time until within a few weeks of his death brief notices, memoirs and volumes appeared in rapid succession. There seemed to have been no limit to his capacity for hard work. He studied the Cretaceous, Triassic and Carboniferous in detail, and his works on the coal fields of Saxony and Germany were marvels, when published, almost half a century ago. His papers on paleontology, vertebrate and invertebrate, and paleobotany are numerous and important.

He was put in charge of the Royal Mineralogical Cabinet at Dresden in 1846 and retained the position until 1898. The collections increased rapidly, so that, in 1857, the Royal Cabinet became the Royal Museum which in later years was one of the chief attractions for foreign visitors. In addition to his other labors, he was professor of mineralogy in the Royal Polytechnic school of Dresden from 1850 to 1896, serving meanwhile upon numerous government commissions.

Professor Geinitz was a typical student, caring little for things of this world, devoted to geology and his family. He was genial, sincere, a tender father, a generous friend. By his death German science has lost one of its most conscientious workers and Saxony one of its most respected citizens.

Dr. Alexis A. Julien and Dr. Theodore G. White were unanimously elected chairman and secretary, respectively, of the section for the ensuing year.

Dr. Henry B. Kümmel, Assistant State Geologist of New Jersey, read a summary of the information thus far collected in regard to the geology of 'The Palisades' of the Hudson river, illustrated by numerous views, many of them taken by Mr. Prince, of Orange, N. J. Most of the details of the paper will be found in the 1897 Report of the State Geologist of New Jersey. Observers are nearly all agreed that the Palisades are an intrusive trap sheet which has cooled at great depths. The basal contact is observable at 19 localities, in 15 of which the trap is unconformable upon the sandstone and shales beneath, and is penetrated by tongues of the latter, and in three is apparently conformable. The altitude of the lower contact increases from the south to the north, where it reaches 200 feet elevation. The upper contact is seen in six localities. At three of these, dikes penetrating the overlying shales occurred at the contacts, in two the contact is unconformable and in one conformable. In every instance the

beds superjacent to the trap are metamorphosed. In no locality of the Palisade range proper does the upper contact of the trap show any of the characteristics of surface cooling. Well-borings at Fort Lee penetrate 875 feet of trap, and the total thickness probably exceeds 950 feet, much erosion having taken place. Subsequent to deposition of the underlying sandstones the area was tilted, and the sandstone wasted away by erosion of many streams, the vacant channels of which are still present. The largest of these stream gaps was one and a half miles wide and is just north of the New Jersey state boundary. The cutting of gaps throughout the dissected tilted peneplane which remains was very uniform and indicates that the former land level was 220 feet lower than the present. If this is the case we have an instance of rivers beheaded close to their mouths. In addition to the wild beauty of the Palisades escarpment, the timber of this tract is the most luxurious and valuable of the State of New Jersey, although its area is much less than that of the pine groves of the south.

Professor John C. Smock, State Geologist of New Jersey, followed with an account of the efforts expended 'On the protection of the Palisades' from devastation by quarrymen. Legislative prohibition of such destruction is retarded by (1) lack of interest in the matter on the part of residents of southern New Jersey, (2) prospects of the future commercial value of the riparian lands at the base of the cliffs for purposes of shipping and manufacturing, which the removal of a portion of the cliffs would render available, (3) the present value to the state of its quarrying interests along the water front, (4) the income derived from riparian grants of these lands from the state to the quarrymen, which is devoted to the maintenance of the public schools, the approximate value to the State for this purpose of the lands from Fort Lee to the State border being about one million dollars. This clash between the interests of the schools and the preservation of beautiful scenery is the most serious obstacle with which legislation against defacing the Palisades has to contend.

In the face of these obstacles it is evident that the wholesale absorption of this territory for a purely sentimental object is impossible. The opposition to such a scheme could only be broken by years of fighting, and in the meanwhile the destruction of the cliffs and wooded slopes would continue with ever-increasing extent.

As a compromise Professor Smock proposed that an interstate commission of New Jersey and New York lay out a driveway along the base of the Palisades, quarrying, manufacturing, and shipping interests to be confined to the water side of the driveway, and the cliff side to be permanently preserved intact after the drive is completed. Edinburgh, Quebec and Sterling were cited as exhibiting rocky heights whose grandeur was enhanced by the fringe of manufacturies at their base, such buildings lending a basis to the eye by which to measure the proportions of the cliffs. Cliff defacement is also in progress upon the New York Palisades, where are the grandest wooded slopes and highest peaks. There is no need of encroachment on the cliffs, in either State, for there are many other places where as good material exists in equally great quantities and can be mined at practically the same expense.

Whatever is done should be done at once, or else we shall have lost a great part of the scenery which we wish to preserve. Steps should be taken to turn into a vast park as much of the territory as it is practicable to preserve, without destroying or coming in contact with the large public and private business interests that are involved.

In discussion Mr. Kunz voiced the sentiment that the opposition to legislation arose more with the officials at Trenton, than with residents of southern New Jersey, and felt that smoke and other nuisances from factory settlements along the cliff would be seriously detrimental. Were a restricted park created the value of residential property would in a few years benefit the State many times over the value of the riparian grants. Railroad tunnels might be permitted at distances of a few miles apart, with commercial villages at their waterfront terminals. The stone from such tunnels would defray the cost of quarrying.

Dr. Levison suggested that the removal of portions of the talus would increase the ap-

parent height of the cliffs, if blasting of the latter could be prevented.

Professor Dodge described the similar trap formations of Connecticut.

After a vote of thanks to both lecturers the meeting adjourned.

THEODORE G. WHITE,
Secretary of Section.

DISCUSSION AND CORRESPONDENCE.

THE PLUMAGES AND MOULTS OF THE INDIGO BUNTING (*Passerina cyanea*).

IT is no new idea that the Indigo Bunting changes color without moulting, but just as one swallow does not make a summer, neither does one bird make 'aptosochromatism' an assured fact. This, however, is what a recent writer (Birtwell, SCIENCE, N. S., Vol. XI., Feb. 23, 1900) would have us believe, and yet there is quite a different way of looking at his supposed facts which suffer from the very 'individual error and dogmatism' he deprecates in others. He says "It is a singular fact that certain individuals have conceived the idea that a feather once having passed its premature condition (what may this be, please?) is utterly disconnected with the vital system of the bird and such individuals cling to this belief with a tenacity wonderful to behold." Doubtless it does seem 'wonderful' to persons who would wave aside all the careful observations that have been made upon feather growth and feather wear, and plumage generally, but possibly it is not so wonderful as the strange things they see just as soon as they watch a bird of striking colors in a cage. It is well to understand some elementary and fundamental facts that are self evident before having recourse to theoretical explanations, and lest Mr. Birtwell's conclusions be taken too seriously, it is my present purpose to first explain the plumage changes which regularly occur in the wild Indigo Buntings and then show why observations upon caged ones are open to doubt.

The Indigo Bunting regularly moults twice every year, differing in no wise in this respect from many other species, and like some of them it is also peculiar in requiring several moults to reach the adult plumage. This is what usually takes place in highly-colored species, and another peculiarity, if such it may be called, is the retention at the time of one moult of the feathers of certain areas until a later period of moult, a mixture of older and newer feathers in juxtaposition being the result. The key to the whole matter lies in understanding the principle of *sequence of plumages* as I have called it (*Auk.*, XVI., 1899, pp. 218–220, pl. III. and XVII., 1900, pp. 34–43) which is adequate to explain all parti-colored plumages without recourse to theory. I regret, that owing to unfortunate delays another article which explains the principle and its application at more length is still in press, so that it is not at present available for reference.

To understand clearly the successive stages of plumage in the Indigo Bunting it is desirable to take them up in the order in which they occur.

Natal Down. — On hatching, the chick is sparingly clothed with long downy filaments, the precursors of the definitive feathers to the apices of which they are attached. The down varies very little among the many species of Passerine birds.

Juvenal Plumage.—This second stage succeeds to the downy, part of the feathers being acquired before the bird leaves the nest. Brown is the prevailing color, paler below with streaks most obvious on the breast. In females the remiges and rectrices are wholly brown also, but in males they usually have a greenish blue tint most marked in the tail and varying in intensity according to the individual. The body feathers are looser in texture than are those of the next stage, assumed by the postjuvenal moult which occurs in the latitude of New York during August and September.

First Winter Plumage.—The third stage of plumage, commonly known as the 'autumnal,' is similar to the previous one, the moult usually involving only the body feathers. In males, the feathers of the throat especially become basally more or less tinged with dull blue, the females remaining dull brown and gray. Some males, however, assume by a more complete moult a new tail and several, usually, five or six, distal primaries which are nearly black and distinctly edged with bright blue. Indisputable